Speech Science
WiSe 2024/2025

Exercise 8: Prosodic Analyses
&
Manipulation of pitch and duration

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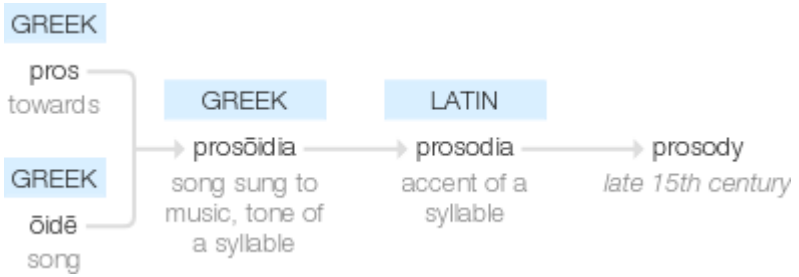
Prosodic Analyses

What is this?

Exercise 1: Goal or no goal?

How did you know? What did you base your decision on?

Prosody



- Study of elements of speech that are not individual phonetic segments (suprasegmentals)
- Properties of syllables and larger units of speech:
  - Intonation
  - Stress
  - Rhythm
- Aspects to measure:
  - F0 over time, pitch contour
  - Intensity (over time, patterns)
  - Quantity (duration of speech units)

Exercise 2: Prosodic analysis

- Have a look at the audio recording of the commentator (commentary.wav) in Praat
- Pay attention to these three main aspects of prosody:
  1. Intonation
  2. Quantity
  3. Intensity
- Measure the pitch range and speech rate in the audio file

Exercise 3: Without listening! – Visible prosody

- How do the three recordings (Tor1, Tor2, Tor3.wav) of the utterance **"Ich habe ein Tor geschossen"** differ from each other in terms of pitch contour, intensity pattern and speech rate?
- Which utterance belongs to which recording?

Did I really just score a goal?	I scored a goal.	I am the one who scored a goal.
Question	Statement	Emphasizing the subject

Exercise 3: Without listening! – Visible prosody

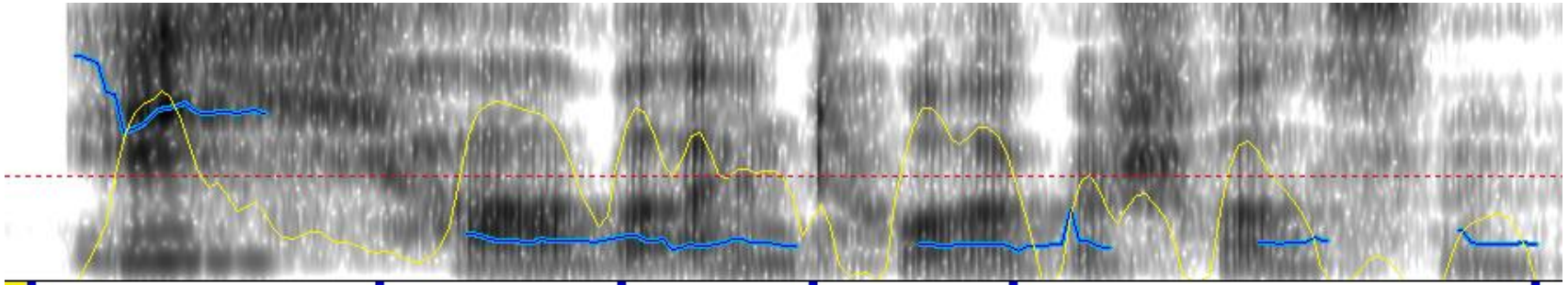
- Which utterance belongs to which recording?

Did I really just score a goal?	I scored a goal.	I am the one who scored a goal.
Question	Statement	Emphasizing the subject

- Open the recordings + the TextGrids with Praat and find out which syllable is marked by f0 peak and high mean intensity
- Measure the speech rate (in syllable/second)

Exercise 3: Observations

1



? I C	h a: b @	? aI n	t o: 6	g @ S O s @ n

		?IC	ha:	b@	?aIn	to:6	g@	SO	s@n
F0 peaks	1								
	2								
	3								
High mean intensity	1								
	2								
	3								
Speech rate (syllables per second)	1								
	2								
	3								

Exercise 3: Observations

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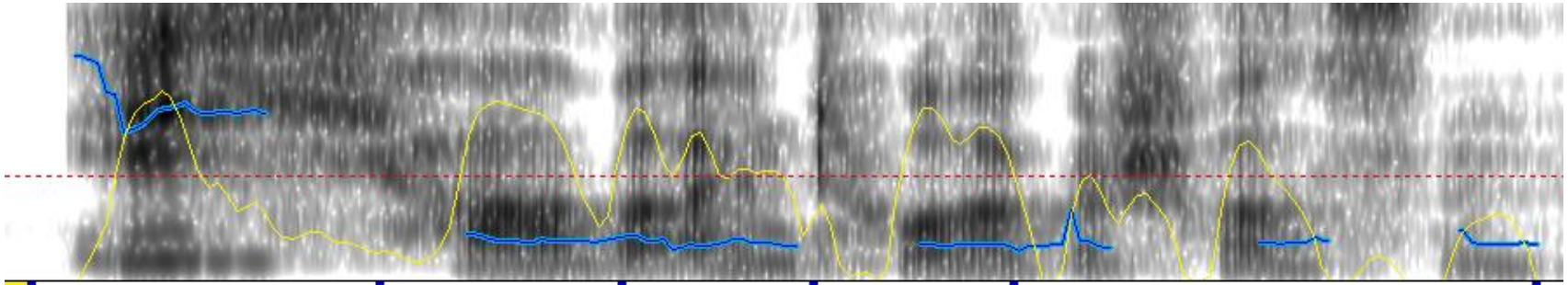

? I C	h a: b @	? aI n	t o: 6	g @ S O s @ n

		?IC	ha:	b@	?aIn	to:6	g@	SO	s@n
F0 peaks	1	X							
	2								
	3								
High mean intensity	1								
	2								
	3								
Speech rate (syllables per second)	1								
	2								
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Exercise 3: Observations

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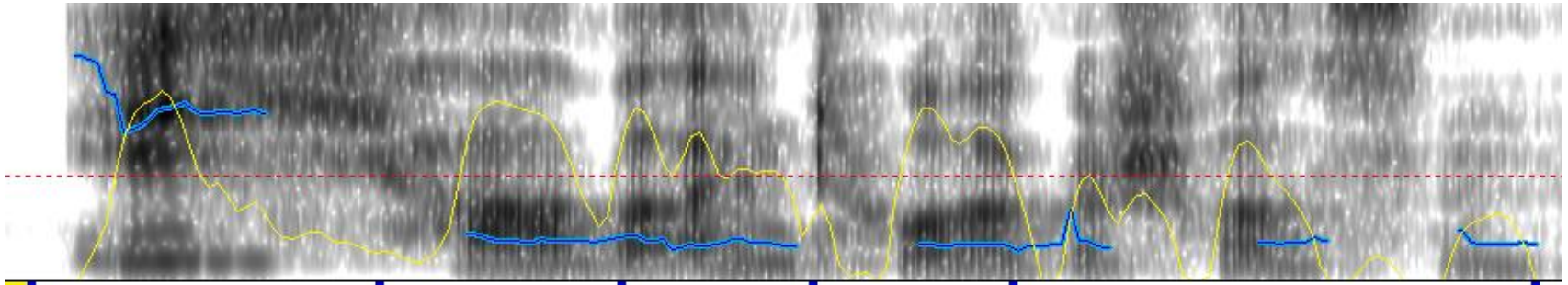

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		?IC	ha:	b@	?aIn	to:6	g@	SO	s@n
F0 peaks	1	X							
	2								
	3								
High mean intensity	1	X(not really)							
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	3								
Speech rate (syllables per second)	1								
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Exercise 3: Observations

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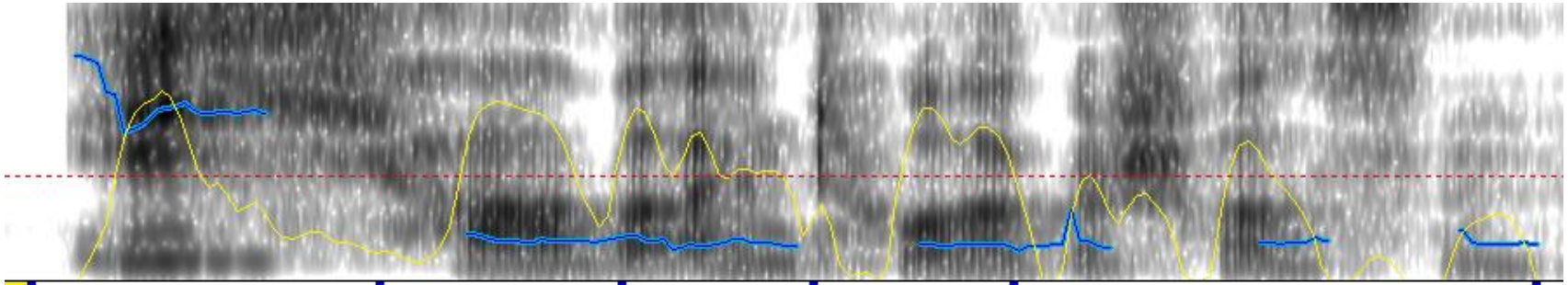

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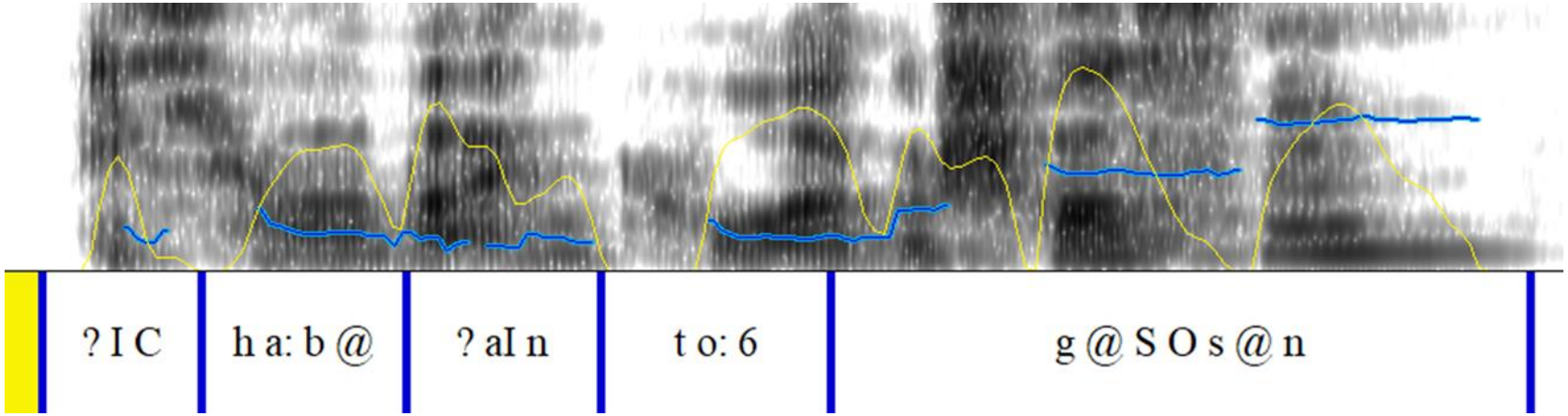
Speech rate (syllables per second)	1	8/1,73 = 4,62							
	2								
	3								

Exercise 3: Observations

2



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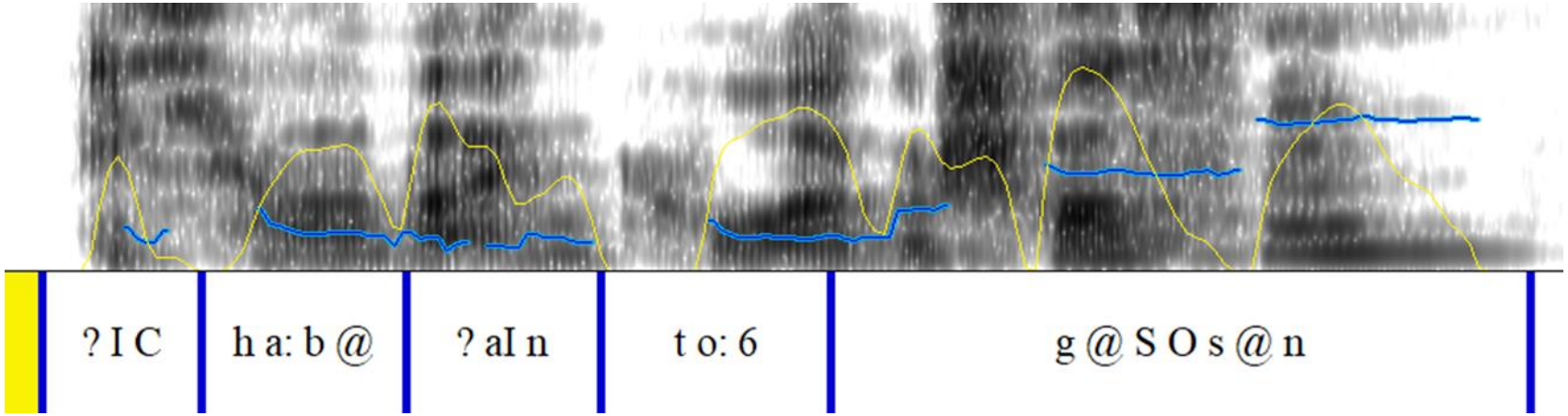

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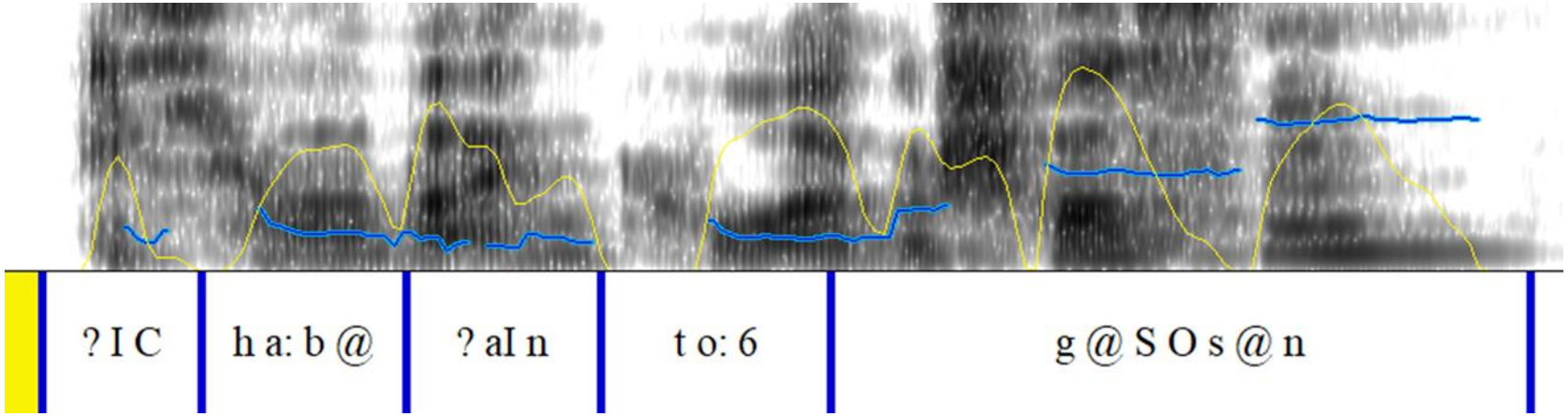

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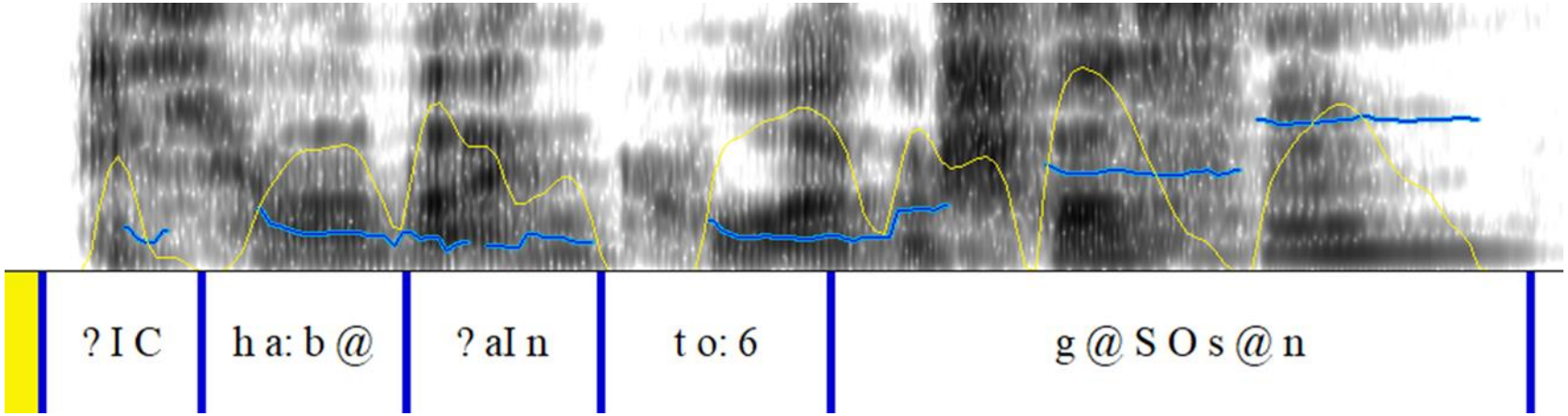

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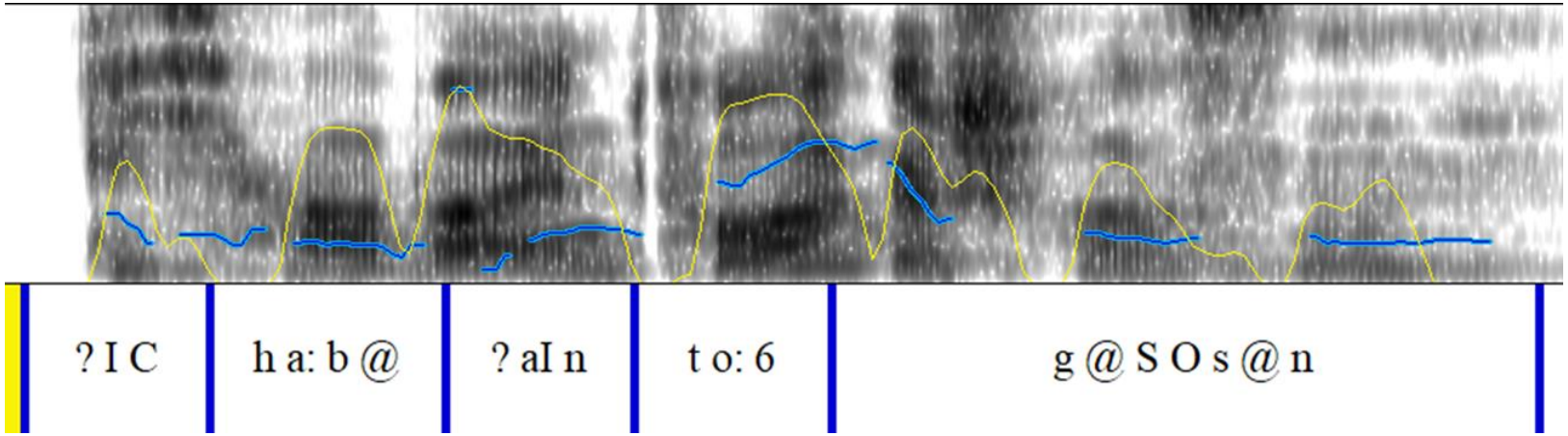
Speech rate (syllables per second)	1	8/1,73 = 4,62							
	2	8/1,68 = 4,76							
	3								

Exercise 3: Observations

3



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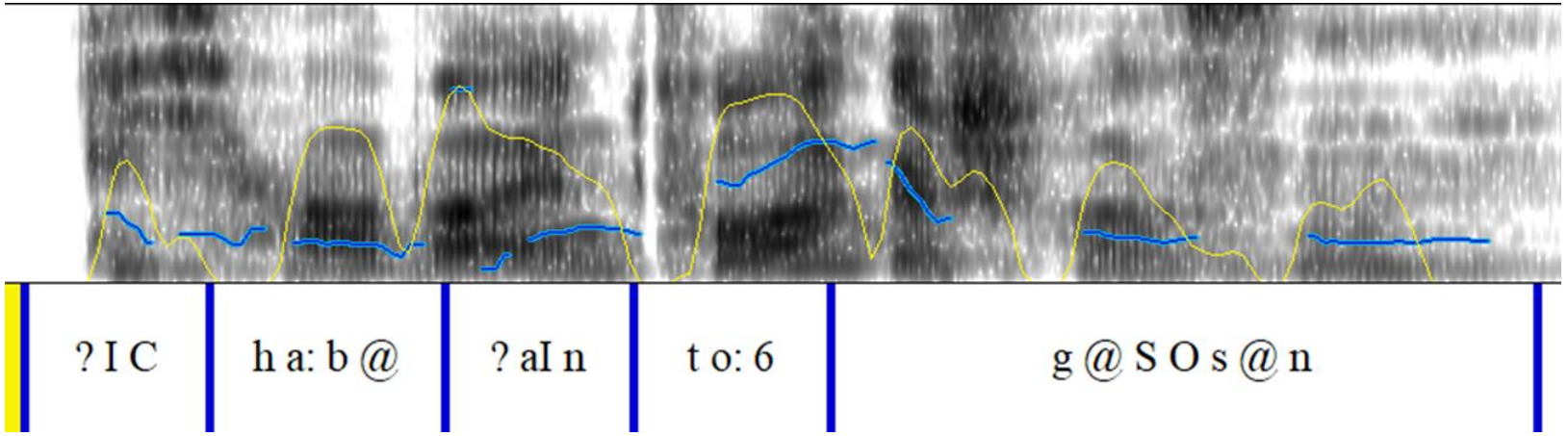

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Exercise 3: Observations

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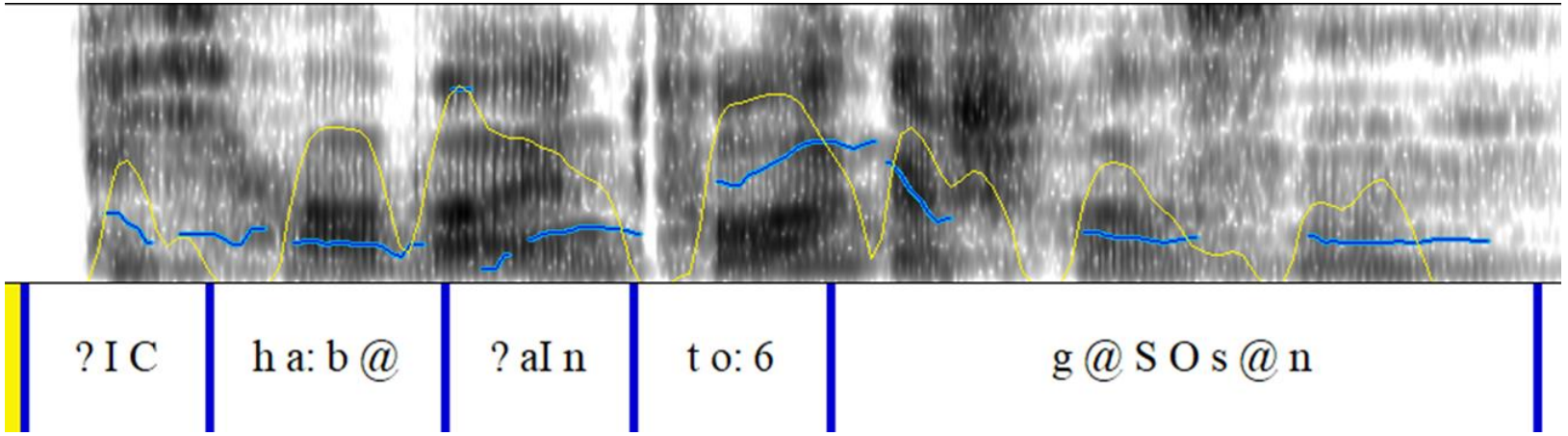

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Exercise 3: Observations

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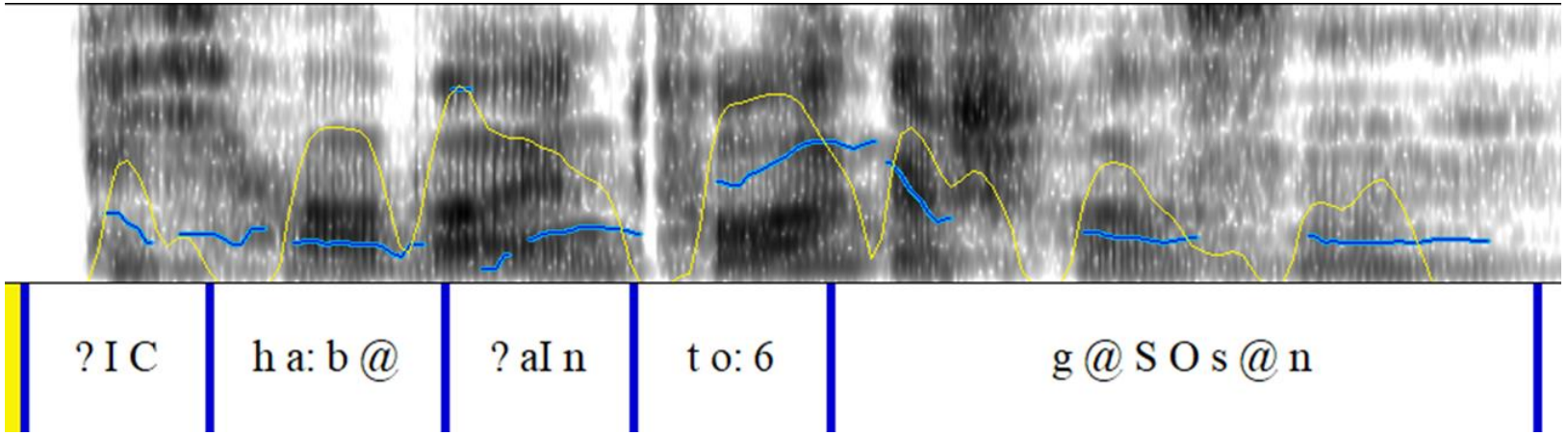

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	3					X			
Speech rate (syllables per second)	1	8/1,73 = 4,62							
	2	8/1,68 = 4,76							
	3	8/1,60 = 5,00							

Exercise 3: Observations

Did I really just score a goal?

Question

I scored a goal.

Statement

I am the one who scored a goal.

Emphasizing the subject

		?IC	ha:	b@	?aIn	to:6	g@	SO	s@n
F0 peaks	1	X							
	2								X
	3					X			
High mean intensity	1	X(not really)							
	2							X	
	3					X			
Speech rate (syllables per second)	1	8/1,73 = 4,62							
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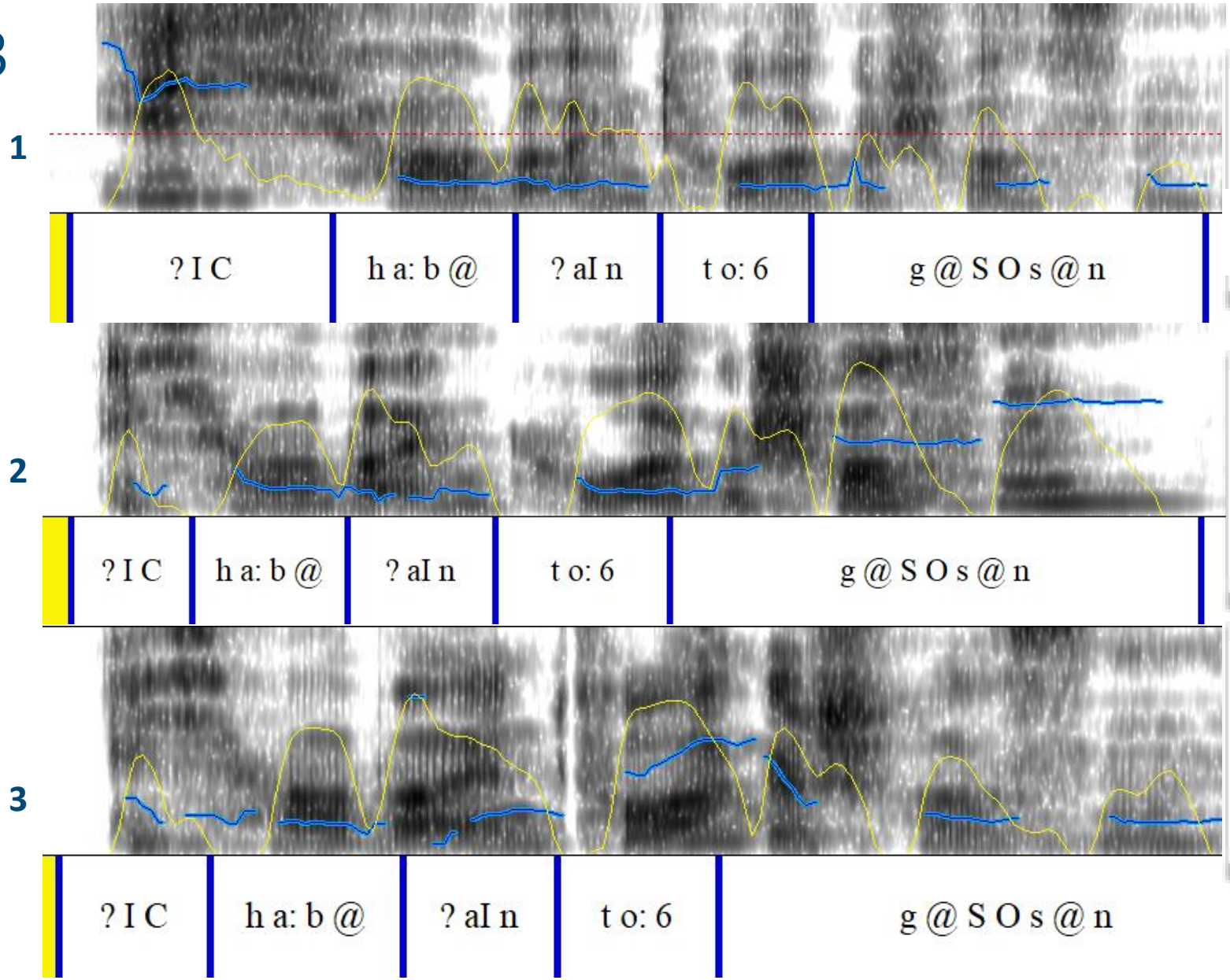
Exercise 3



I am the one who scored a goal.

Emphasizing the subject

Did I really just score a goal?

Question

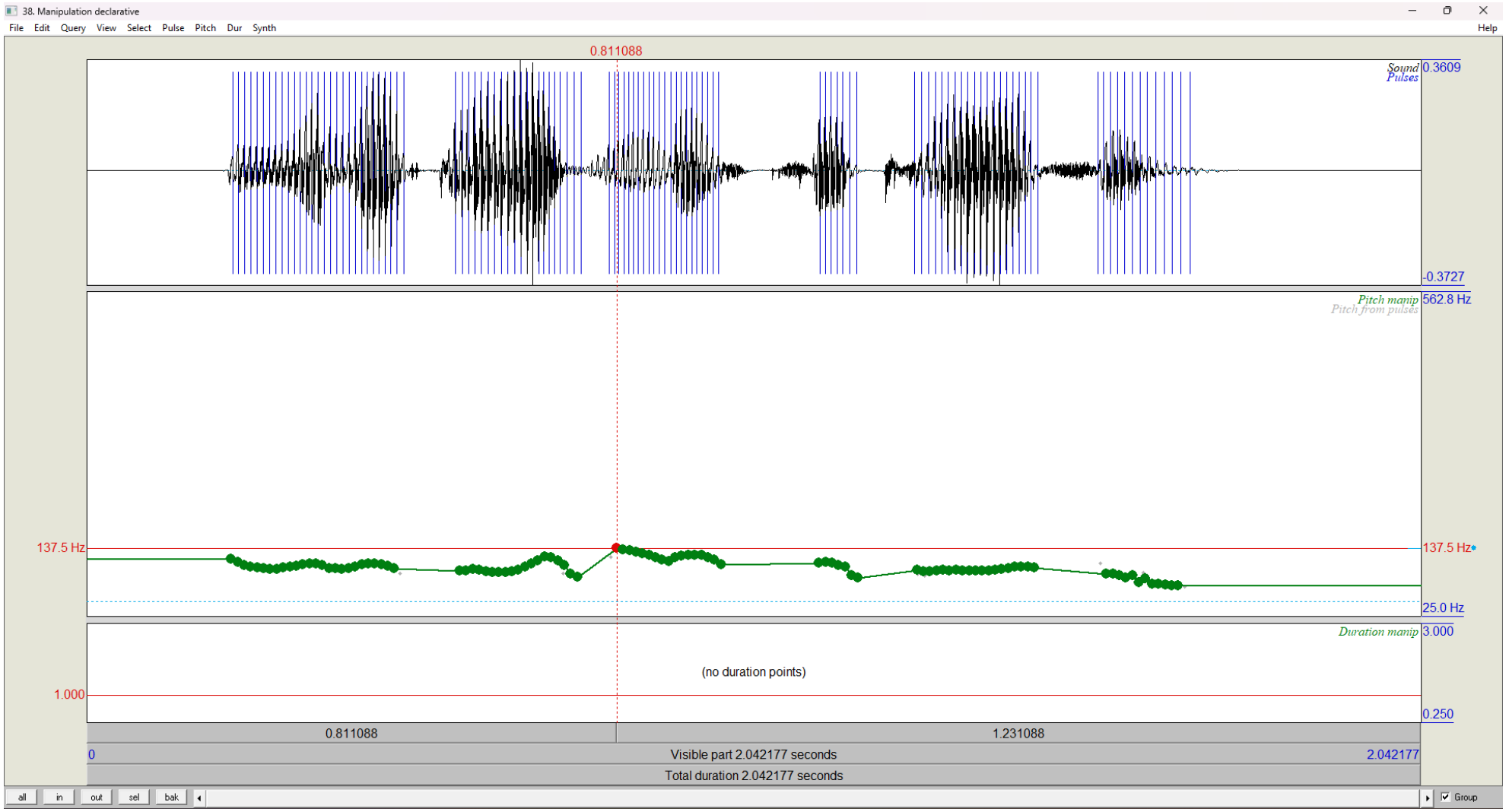
I scored a goal.

Statement

Manipulation of pitch and duration

- Select *Sound object*, click **Manipulate → To Manipulation…**
- For female voice: set minimum pitch to 100 Hz, maximum pitch to 500 Hz
- For male voice: set range to 75-300 Hz
- Open resulting *Manipulation object* by clicking View & Edit

Manipulation of pitch and duration



Manipulation of pitch

- Reduce number of dots: **Pitch → Stylize pitch (2st)**
- Create additional dots: **Pitch → Add pitch point at cursor** or **Pitch → Add pitch point at…**
- Manually relocate dots within the time-pitch area
- Extract the modified sound as separate object: **File → Publish resynthesis**

Manipulation of duration

- Add targets to empty tier: **Dur → Add duration point at cursor** or **Dur → Add duration point at…**
- Manually relocate dots within the time-pitch area
- Blue dotted line: value of 1 = original speech rate
- Create speech half as fast = 2; Create speech twice as fast = 0.5
- Extract the modified sound as separate object: **File → Publish resynthesis**

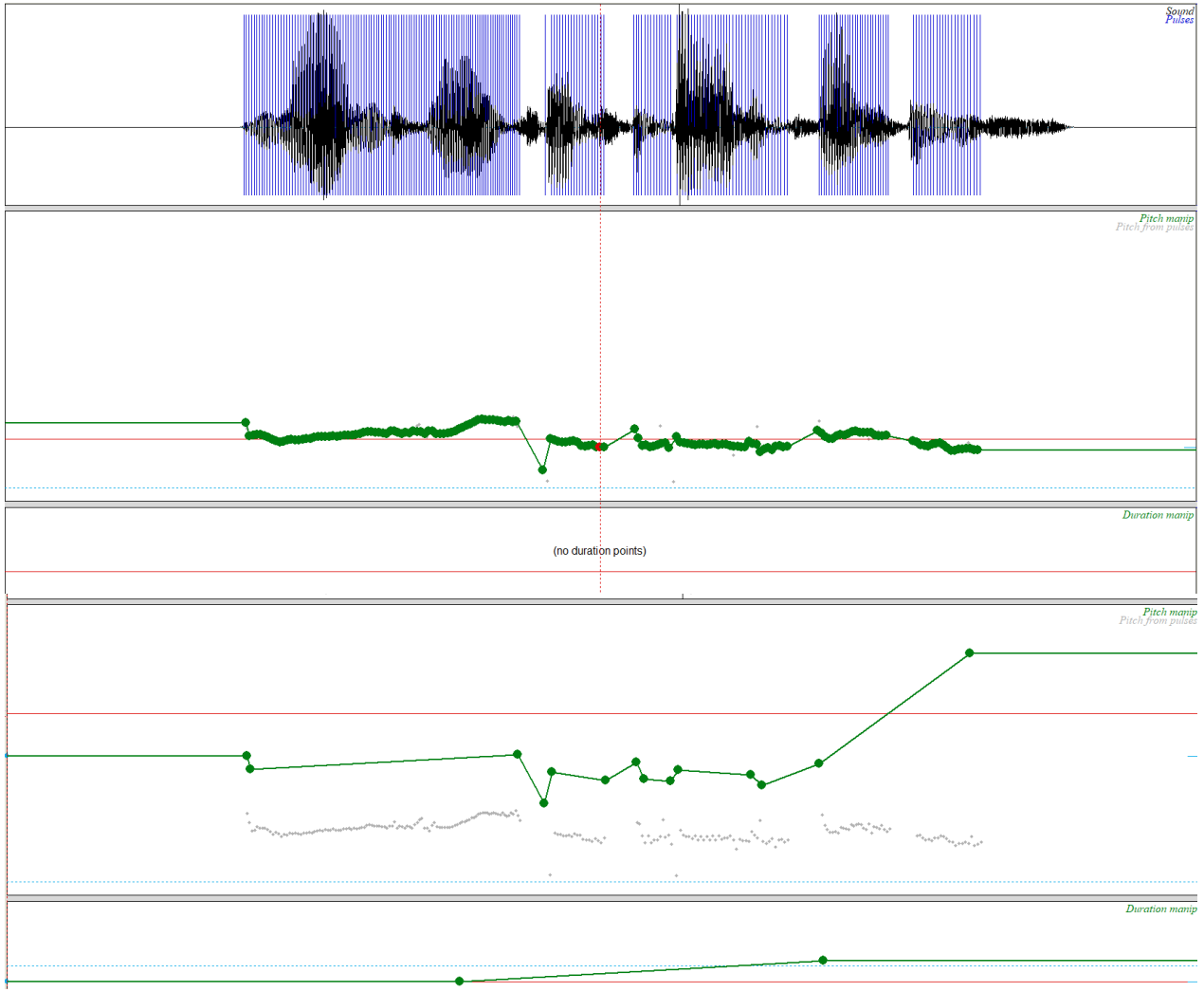
Exercise 4

Modify the sound file (presents.wav) in a way that makes it sound like a question asked by a high-pitched male who starts the sentence with a relatively fast speaking rate and becomes slower towards the end of the sentence.

Manipulation of pitch and duration

Original

Manipulation



Assignment 7: Have wonderful holidays!

Thank you for your participation!